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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,815	01/18/2002	Phillip L. Wimmer	10012053-1	3187

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EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/052,815	Applicant(s) WIMMER ET AL.	
	Examiner Marianne L. Padgett	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7-21,25,26 and 33-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-21,25,26 and 33-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. The disclosure is objected to because of the following informalities: while reviewing the specification in order to determine whether various cryptic limitations in the claims were provided with clear definitions of their scope, it was noted that on page 15, line 13, --excimer-- is misspelled.

Appropriate correction is required.

2. It is noted that on page 6, lines 18-29, especially 18-21, applicants have redefined the normal meaning of "adhesive" to be broader than it's commonly employed meaning, such that an adhesive when considered with respect to the present invention, i.e. in the claims, has been redefined to mean any coating or material that adheres to another material, i.e. the substrate. While this is inclusive of what most people usually mean by adhesives, it also encompasses any other coating or deposited material that does not fall off the substrate.

It is noted that claim 1 is technically noncompliant, since in line for applicants forgot to delete the "a" before "the substrate" which they crossed out in their previous amendment of 11/14/2005. Note that this is an excellent example of walleye one is supposed to use double brackets to delete single words, especially for those such as "a", where it is almost impossible to see that they've been crossed out! Applicant needs to be sure to correct this omission in their next amendment.

3. Claims 1-5, 7-21, 25-26 & 33-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

What scope of things or materials intended to be encompassed by the term "an initiator" is unclear for several reasons. First, in claims 1 & 21 the phrase describing the initiator "in the form of precursors of the structures formed by ablation of a substrate" is self-contradictory, or impossible unless one uses a time machine, since precursors of structures (?Forerunners of structures or proto-structures?) that have already been formed (past tense used) no longer exist, because they would have been used up or superseded. (It is noted that page 8, lines 10-11 uses this phrasing, which means it was supported, but that

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does not make it any less confusing or inaccurate.) Assuming that applicants are intending to claim the embodiments consistent with figures 4-5, discussed on pages 9-11+, perhaps applicants' intent with more accurately read --an initiator that is a precursor of structures to be formed by ablation of a substrate--, which in claim 1 would be consistent with the options on of dependent claims 2-5, which are consistent with the embodiment of figures 4-5. As presently phrased it is unclear how the claimed "initiator" that has no clear part in initiating anything, as there is no antecedences or clear language tying the providing limitation to the directing limitation (i.e. note in claim 1 the structures of the providing step have no necessary relationship to the structures of the directing step).

Also note in claim 1, that since order of listing does not necessitate order all the performing, and due to the lack of temporal or antecedent language, the "applying" step may be done at any time with respect to the providing in directing steps, which in itself is not a clarity problem, however it means that the body of the claim he is not commensurate in scope with the preamble is directed to a method of "preparing a surface for adhesion". Note that similar considerations are applicable to independent claims 18 & 21.

What applicants mean or intend by "shadow" or "non-shadowed portion", or the like in the claims is somewhat unclear or ambiguous, as the use of shadow, etc., in the claims & specification does not appear to be wholly consistent with the standard meaning of the term, nor have applicants redefined the term to mean something other than its standard meaning (as they have done with adhesive). When there is space between an object that is opaque to a light source, and another object, the opaque object casts a shadow on the other object depending on the angle made with the light, but no shadow is cast at interface is where the two objects are touching, i.e. a vertical pole stuck in the ground casts no shadow when the sun is directly overhead. However, in applicants figure 4, reference number 54, the "cone initiator 56" which appears to be deposited on an attached to substrate 36 is said to create "shadowed portions 58" directly underneath the cone initiator, i.e. in a location where there can physically be no shadow. On the

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other hand, figure 7 described on page 16 is using the word shadows in its conventional meaning, but contrary to conventional usage calls features of the mask, initiators, when the opaque portions of the mask are not properly initiating anything, but actually preventing ablation from occurring, thus also contributing to the uncertain meaning or scope of the term initiator. Therefore, it is unclear or ambiguous when considering the limitations involving shadow in the claims whether one should consider only the actual meaning of the word, or whether one should consider anything deposited or touching a substrate to also be causing a shadow underneath it, all i.e. all interfaces are shadows?

Use relative terms that lack clear metes and bounds in the claims, or in a clear definition in the specification or incited prior art, is vague and indefinite. In claim 18, in the preamble, see "increasing", which is relative, because no baseline or comparison has been provided to define from what "increasing adhesion" is to be defined or measured. In claim 21, "hi" and "low" are relative modifiers with no defined scope, however it is noted that making a relative comparison between the two terms, i.e. use of --high-- and --low--, would correct this problem.

In claim 10, while not a formal problem applicant may wish to note that the preamble statement of "a method of preparing a surface for adhesion" is only intended use that is never acted upon, thus has no patentable significance to the body of the claim.

In claim 10, both lines 3 & 8 claim "directing laser radiation towards the surface of the substrate", and while the claimed language & order implies that these are different steps, it is not actually necessitated because the "further" in line 8 could be supply to the additional limitation that defines the intensity, there are no temporal requirements relating these two steps, and because "the debris" referred to is not necessarily deposited, i.e. resettled" onto the surface of the substrate. Furthermore, in claim 11, the lack of clear differentiation between the two creates ambiguity, such that their apartment of "prior to directing laser..." could be referring to either of the steps, such that for the option where they are different steps one laser directing step can be supplying the initiator of claim 11 and its dependent claims (particles

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may equal debris), prior to the second performed laser directing step, or claim 11 might be intended to being prior to both steps. It is unclear.

In claim 13, as proper antecedent language is not employed to connect the structures of this claim to those of the independent claim, there is no necessary relationship therebetween, possibly creating a broader scope than applicants actually intended.

In claim 18, due to the lack of antecedent requirements and/or temporal language, the meaning may be considered ambiguous as to whether the directing step of lines 3-4, and the ablating step of line 7 are necessarily different steps or not, alternately one might not consider this a clarity problem at all, but merely interpret the claims broadly to mean either option of being the same step or different steps.

Claim 19 might be considered to have similar ambiguities, as it is unclear whether the ablating of the last two lines is acting on the structure described in the preceding part of the claim, or if it is forming what was described, especially since line 5 says "to form structures in the covered portion..." (emphasis added) instead of on them. The examiner suspects from the taught embodiment that the former was intended. Also note that the term "uncovered" can be considered ambiguous also, because it can mean not covered or to have removed something that was previously covering the surface.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 10-11, 13 & 16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Taylor et al. (The Effects of Debris Formation on the Morphology of Excimer Laser Ablated Polymers).

As noted above, since the preamble of claim 10 is only intended use, where no limitation is ever actually claimed that requires adhesion of anything, unless one counts the resettling of the ablation debris, the claimed laser process need not be used as a pretreatment for a subsequent deposition.

The process discussed in Taylor et al. laser ablates polymers, such as polyimides, where debris which is mostly elemental carbon from the laser ablation accumulates on the surface forming symmetrical debris patterns, that can be varied depending on the laser fluence employed, such that higher fluences may create graders without cones, while lower influences will create simple cones. Taylor et al. notes that at low influences certain localized regions in the polymer are harder to a played leading to accumulation of debris & growth of conical shaped structures. Particularly say the abstract; the introductory paragraph on page 2815, particularly the top half of each column thereon; figure 1 on page 2816 which shows photographs of various debris patterns; the first column on page 2816 which discusses multiple laser shots for establishing debris patterns; the bottom of the second column on page 2816 which discusses debris with us being related to ablation thresholds; and the second column on page 2817, particularly the lower

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half, which discusses conformation with respect to ablation thresholds influences due to accumulation of ablated debris.

6. Claims 15 & 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al.

Taylor et al. differs from claim 15, as its teachings are directed towards polymers generally, with specific examples of polyimide or polyethylene terephthalate, hence it would've been obvious that one ordinary skill in the art to apply the techniques of Taylor et al.'s process to virtually any class of polymers with the appropriate choice of laser/wavelength that with light absorbable by the particular polymer, thus making the class of liquid crystal polymers an obvious alternative, where one of ordinary skill would use the general teachings provided by Taylor et al. for routine experimentation to determine what laser parameters were necessary in order to produce desired debris patterns on a specific polymer material.

With respect claim 36, Taylor et al. does not teach any particular height for any specific debris patterns produced on the polymer surface by laser ablation, however in the second column on page 2817, it is indicated that for particular parameters, related to ablation thresholds and influences applied a declaration of debris products it cannot be further ablated can produce cones, where the "debris width" is related to parameters employed, while on the first column of page 2816, there's discussion of varying number of shots from the laser employed to produce debris patterns, and various diameters of cones, various structures etc., depending on laser parameters, hence will column heights per se are not discussed variation of size overall is associated with control affluence and use of ablation thresholds, etc., hence it would've been obvious to one of ordinary skill in the art to control their laser ablation parameters, thus debris patterns produced, dependent on the desired degree of roughness desired for a particular enduse, where they claimed height of structures from the substrate surface of between approximately 2-5 μ would have been within the bounds of Cohen Heights or rim heights expected dependent on combinations of spot width and fluence of the laser.

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7. The previously cited and applied patent Owen et al. (5,593,606) is noted to have discussion (column 13, lines 32-66 & figure 4) related to the same concepts as set forth by Taylor et al., where the power density related to the laser affluence effects the related ablation & debris plume produced thereby, with the first laser pulse producing a debris plume that acts as a filter or a mask for subsequent beam pulses, which is equivalent to the teachings of Taylor et al., except without mechanistic or descriptive discussion of debris patterns or their formation, but emphasizing the effect of the debris on subsequent impinging laser light.

8. With respect to the previously applied rejections in the action mailed 3/10/2006 over Slysh (5,147,680), the present examiner notes that only generic teachings that might encompass any ablation of substrate material are found in the abstract or on column 3, lines 49- 53, where roughening or scoring with a laser immediately preceding the maskant stream deposition, might be affected via laser ablation, but this is not necessitated as laser techniques that merely cause the formation without ablation or etching can also affect roughing or scoring. The previous examiner was correct in stating that Slysh is silent on what happens to any debris that might be caused by this laser roughening or scoring process, however applicants point on the teachings of the use of forced air ventilation (reference number 40; column 2, lines 44-48; column 3, lines 27-35; & column 4, lines 42-49) has some relevance, since while this exhaust is used to entrain volatile products and debris from the maskant deposition process, that results from laser treating of this coating material before it's deposited or trimming the edges of the maskant the very instant it is applied (column 2, lines 5-20), this same ventilation system depending on its positioning or means of ventilating, would likely to have had an effect on any debris that might have been created by the laser roughening process, however the initial presence of debris from the laser roughening, and it's hypothetical redeposition is too speculative for the previously combined references in the prior rejection..

9. With respect to the rejections over Drzal et al., the present examiner notes that this reference is directed to a process of using UV lamps to modify surfaces to improve the adhesion for subsequently applied coatings, via a process that chemically modifies the surface (column 3, line 1-column for, line 10), as opposed to affecting ablation by laser as claimed by applicant. Furthermore, while there is a mention of the use of UV lasers to cause ablation or surface roughing, such that it is implied to be for improving the adhesion (column 4, lines 21-25), it gives no details of the process, merely been cited as a more expensive process than that of this patent is invention. In Drzal et al.'s background (column 1, lines 50-55), there are mentioned 2 patents used for laser treatment of surfaces, such as the removal of paint, which can be sitter to exemplify the processes being referred to in column 4, however Werth et al. (4,803,021), while directed to laser ablation to increase adherence, explicitly requires removal of decompose fragments, because of the need to clean off mold release layers that will interfere with the adhesion of subsequent coatings; and Woodruffe (4,756,765), while specifically teaching laser ablation of surface materials, the paragraph bridging columns 3-4 (+) teaches that one damages the substrate severely if one uses laser fluxes too low such that one causes the paint to char and stick to the substrate, as opposed to being removed. While these teachings in Woodruffe are related to those of Taylor et al., they fail to provide a motivation to use the charred and stuck results for adhesive purposes.

10. The literature references to Krajnovich (et al.), provide cumulative teachings to the conformation discussed in Taylor et al., particularly for polyimides or photoablation of other polymers, with further discussion of the effects affluence and other parameters on the conformation, with particular emphasis on the formation of localize carbon enrichment for initiating conformation, for a seeding effect. In the Krajnovich article "Formation of Intrinsic Surface Defects..." (1993), particular see the abstract; page 3002, first 2 full paragraphs; page 3003, second column; page 2004 second column; paragraph bridging pages 3005-6 & first column page 3006; & first two full paragraphs page 3007.

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11. Claims 10-11, 13 & 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Brennen et al. (2005/0242059 A1 \equiv 6,919,162 B1).

Claims 1-5, 7-8, 10-16, 18-20, 33 & 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brennen et al. (2005/0242059 A1 \equiv 6,919,162 B1), optionally in view of Taylor et al. (discussed above).

Brennen et al. discuss texturing polymeric or ceramic substrates via process is inclusive of laser ablation, where lower threshold fluence affects on surface ablation & discussions of formation of cones due to presence of small particles provided on the surface during processing are discussed, with roughening/texturing being done by the laser ablation, inclusive of option choosing masks (in (059) see Abstract; [0058], [0062-65], [0068-69], [0078], [0084-87], [0099], [0109], example 1 in [0126-0133] etc., with analogous teachings in (162)). While the Brennen et al. references do not explicitly discussed the deposition of the debris material into taught texturing and cone formation, it may be considered inherent in the cone formation process with the control fluences as discussed, or alternately obvious to have formed a cones with control which included debris deposition for reasons as provided in the discussion of Taylor et al. who provides means of affecting cone formation that include the debris deposition, which would've been applicable to the control of laser ablation parameters as discussed in the Brennen et al. references.

With respect to depositing subsequent films that it here where the roughening/laser ablation as claimed promotes adhesion, while the invention set forth in Brennen et al. does not explicitly relate to this usage, in the discussion of the prior art in [0030] of (059) & analogously in the patent, it is noted that laser ablation to cause roughening is known to be used for promotion of the adhesion in subsequent processing a substrates, hence it would've been obvious to one of ordinary skill in the art that the laser ablation roughening inclusive of the cone formation process as described in Brennen et al. would have

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been effective for this known adhesion promotion technique, as it has been shown to supply the required roughening with the required energy source of the prior art.

It is noted that in [0086] & [0128], Brennen et al. cite the Krajnovich (1993) article for particle formation in conformation.

12. Claims 10-11, 13 & 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Burns et al. (5,172,473).

Claims 1-5, 7-8, 10-16 & 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burns et al. (5,172,473), optionally in view of Taylor et al. (discussed above).

Burns et al. also discusses cone formation via laser ablation. See the abstract; figures; column 3, lines 6-22 to impurity particles in polyimide; column 4, lines 35-column 5, line 5+ using a mask to form core cones; column 6, especially lines 7- 20 & 44-63, where a conductive layer is deposited on the cone, including a chromium adhesion layer, thus reading on applicants' definition of an adhesive. Above arguments for inherency/obviousness of ablation debris in formation of the cones is again applicable.

13. Claims 9, 17, 21, 25-26 & 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brennen et al. (2005/0242059 A1 \equiv 6,919,162 B1), optionally in view of Taylor et al. as applied to claims 1-5, 7-8, 10-16, 18-20, 33 & 36 above, and further in view of Murthy et al. (6,120,131).

The Brennen et al. references, optionally in view of Taylor et al. do not suggest the specific species of enduse associated with elements of the print cartridge assembly, however as shown by Murthy et al. (abstract; background, including column 1, especially lines 15-32 & 60-column 2, line 25) use of adhesives and polymeric materials that are required to be adhered are old and well known for use in print head assemblies, where debris that specifically interferes with the adhesion is to be avoided, hence it would've been obvious to one of ordinary skill in the art to employ techniques as taught in the combination which improve adhesion and do not result in detrimental debris.

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14. Further art of interest protection in surfaces include Yorkgitis et al. (4868006); Baumgart et al. (5595791); Xuan et al. (5968608); Ogawa et al. (5582878) & Baum et al. (6022596) & Hummle et al. (5597621).

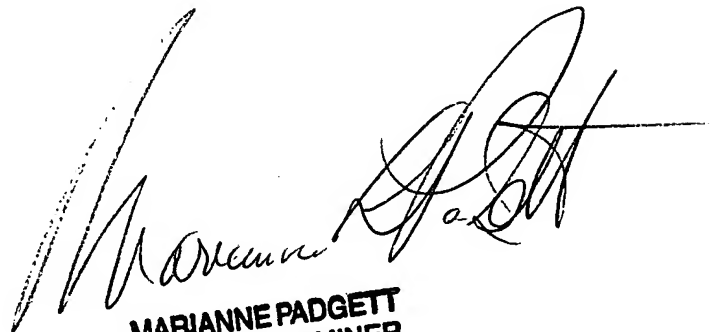
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 8:30 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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8/17/2006



**MARIANNE PADGETT
PRIMARY EXAMINER**